

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
18. März 2004 (18.03.2004)

PCT

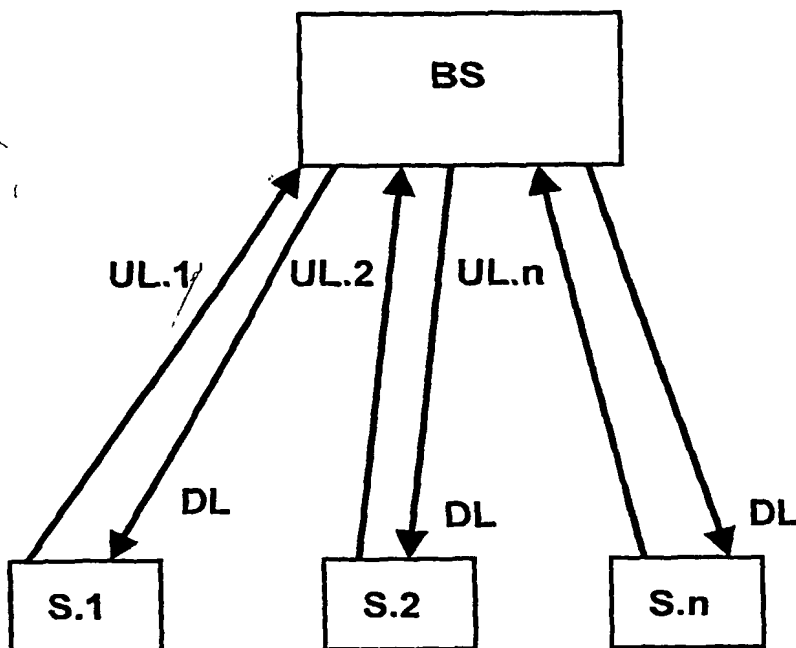
(10) Internationale Veröffentlichungsnummer
WO 2004/023419 A2

- | | | |
|---|------------------------------|---|
| (51) Internationale Patentklassifikation ⁷ : | G08C | (71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): ABB RESEARCH LTD. [CH/CH]; Affolternstrasse 52, CH-8052 Zürich (CH). |
| (21) Internationales Aktenzeichen: | PCT/EP2003/008691 | |
| (22) Internationales Anmeldedatum: | 6. August 2003 (06.08.2003) | (72) Erfinder; und |
| (25) Einreichungssprache: | Deutsch | (75) Erfinder/Anmelder (nur für US): APNESETH, Christoffer [NO/NO]; Conradsgatan 3A, N-0559 Oslo (NO). VEFLING, Harald [NO/NO]; Gipoveien 37, N-3140 Borgheim (NO). ENDRESEN, Jan [NO/NO]; Engelsrudlia 57, N-1385 Asker (NO). DZUNG, Dacfeý [CH/CH]; Albisstrasse 1, CH-5430 Wettingen (CH). |
| (26) Veröffentlichungssprache: | Deutsch | |
| (30) Angaben zur Priorität: | | |
| 102 37 799.5 | 17. August 2002 (17.08.2002) | DE |
| 103 34 873.5 | 29. Juli 2003 (29.07.2003) | DE |

[Fortsetzung auf der nächsten Seite]

(54) Title: METHOD FOR OPERATING A SYSTEM COMPRISING A PLURALITY OF NODES AND A BASE STATION ACCORDING TO TDMA, AND ASSOCIATED SYSTEM

(54) Bezeichnung: VERFAHREN ZUM BETRIEB EINES SYSTEMS MIT EINER VIELZAHL KNOTEN UND EINER BASISSTATION, GEMÄSS TDMA UND SYSTEM HIERZU



(57) **Abstract:** Disclosed is a method for operating a system according to time division multiple access (TDMA), comprising a plurality of wireless sensors and/or actuators as nodes (S.1 ... S.n) and a base station (BS), said system being installed in a machine or an installation, such as an industrial robot, automatic production or fabrication machine. Cyclical TDMA data transmission blocks are transmitted, each TDMA data transmission block being composed of successive time slots, each of which is assigned to a specific node. The uplink signals (UL.1 ... UL.n) from the different nodes (S.1 ... S.n) to the base station (BS) can be simultaneously transmitted on two, three or more different frequencies (f₁, f₂, f₃) while the downlink signals (DL) from the base station (BSA) to the different nodes (S.1 ... S.n) are transmitted on a single frequency that is different from the uplink frequencies. The time slots and the different uplink frequencies

are defined once and are subsequently maintained.

(57) **Zusammenfassung:** Es wird ein Verfahren zum Betrieb eines Systems gemäß TDMA (Time Division Multiple Access) mit einer Vielzahl drahtloser Sensoren und / oder Aktoren als Knoten (S.1...S.n) und einer Basisstation (BS) vorgeschlagen, welches in einer Maschine oder Anlage, wie Industrieroboter, Herstellungsautomat oder Fertigungsautomat installiert ist, wobei zyklische TDMA-Datenübertragungsblöcke

[Fortsetzung auf der nächsten Seite]

Method for operating a system with a multiplicity of nodes and a base station according to TDMA and a system for this purpose

5

Abstract

A method is proposed for operating a system according to TDMA (Time Division Multiple Access) with a multiplicity of wireless sensors and/or actuators as nodes (S.1...S.n) and a base station (BS), said system
10 being installed in a machine or installation, such as industrial robots or an automated manufacturing or production unit, whereby cyclical TDMA data transmission blocks are transmitted and each TDMA data transmission block is composed of consecutive time
15 slots. Each time slot is allocated to a specific node. The uplink signals (UL.1...UL.n) can be transmitted from the different nodes (S.1...S.n) to the base station (BS) simultaneously on two, three or more different frequencies (f1, f2, f3), whereas the
20 downlink signals (DL) are transmitted from the base station (BSA) to the different nodes (S.1...S.n) on only one frequency, which differs from the uplink frequencies. The time slots and the different uplink frequencies of the different nodes are defined once and
25 are thereafter retained.

Significant Fig.: Single Fig.